The Tilburg digital library

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ABSTRACT

This paper presents an overview of the current developments in the Digital Library at Tilburg University. I shall discuss our experiences with the online provision of primary information to our end-users, of journal articles and papers produced by the researchers of our own institution and other services. Positive experiences as well as problems will be discussed. New projects and prospects will provide direction for the library in the years to come. The university library will focus on the provision of added value to the information process in a global environment and on integration of the retrieval and processing of scholarly (electronic) information with teaching, learning, and research.

1. THE DEVELOPMENT OF THE DIGITAL LIBRARY AT TILBURG UNIVERSITY

Tilburg University in the Netherlands is a medium-sized university focussing on the humanities and social sciences. Currently, approximately 9,000 students are enrolled and the total staff number is about 1,600. The university has a compact campus and a sophisticated infrastructure. The faculties of economics and law have an excellent reputation in both teaching and research.

In 1989, the university started a programme to build a new library and initiated detailed plans for the development of the digital library. The Digital Library Programme at Tilburg University (an action plan for a High-Tech Documentation, Information and Communication Centre) aimed to provide staff and students with excellent support facilities for teaching, learning, and research. Key elements in the programme, which initially was supported by Digital Equipment Corp., were:

1. A focus on the use of information technology in order to improve both library procedures and systems, and the services to end-users.
2. The provision of electronic information to the desktop of both faculty and students, on campus and at home.
3. A campus-wide implementation of the concept of the "integrated desktop" .
4. The development of tools for knowledge navigation in order to support the user in locating and retrieving relevant information in the global information environment.

The programme was managed by a partnership of the university library and the computer centre with the firm support of the executive board of the university. The concept of the integrated desktop can be regarded as the cornerstone in the programme. Recognition of the power of electronic communication, the increasing importance of electronic information and the changing

opportunities for end-users, who have access to information through their desk-top computer, was the starting point for the development and implementation of this concept. Working on a single computer, the user should have easy and direct access to secondary and primary information, to various software packages and to communication facilities.

In a university environment, the user is a consumer of information, but at the same time students, lecturers, and researchers also produce new information by making full use of the present body of knowledge and enhancing this with new ideas and research results. The output can be a working paper, an article, a thesis, or a book. This process should be supported by the library in close cooperation with the computer centre.

Tilburg University's network connects more than 2,400 PCs, each of them providing access to locally and remotely stored information. For the students, 450 PCs are available in the library along with an additional 400 PCs in seminar rooms. All 1,600 staff have networked PCs on their desktop. The power of the concept of Tilburg University is that all of these 2450 PCs offer the same basic facilities:

1. *Access to information*
   - local OPAC;
   - local Reference databases, such as the Online Contents database on journal articles and the Excerpta Informatica database on applied computer science. These references are seamlessly linked to full text information and coloured images;
   - the National Catalogue and the National Online Contents database with electronic request and accounting facilities for end-users. Fast document delivery to the end-users can be guaranteed;
   - other central databases hosted by Pica, an organisation for library automation, based in the Netherlands and founded by the Dutch university libraries;
   - Internet resources;
   - networked cd-roms;
   - management information for both students (including the results of examinations, the reservation system for the desktop computers in the library, etc.) and staff (financial and other administrative information);
   - electronic help desk (EVA);
2. *Software packages*, such as word processing, graphical, and statistical software, which are licensed campus-wide and can also be used from home.
3. *Communication facilities,* such as electronic mail, FTP, and the Trumpet Newsreader.

The concept of the Integrated Desktop is an example of a user-oriented client/server implementation.

In 1991, the executive board and the faculties agreed to standardize. It was considered that a campus-wide implementation would be facilitated by a homogeneous infrastructure. Standardization was introduced with respect to:

- the network infrastructure within the departments (the standard is the Novell Netware);

- the desktop computers in the offices and for the students (PCs running Windows are prevalent);
- one preferred PC vendor;
- software that would be supported by the computer centre.

This policy enabled the university to achieve cost-effective solutions. Although some variations in this approach are currently being introduced as a result of differences between departments and differences in the level of use of various facilities, basic models for standardization are still accepted and have recently been reconfirmed campus-wide.

2. FIRST INNOVATIONS

- When the new library was opened in 1992, the **first version of the "integrated desktop"** with access to secondary information, various software packages and electronic mail facilities was made available. Students were encouraged to make reservations for their desktop computers in the library, excellent networked printing facilities were offered, and on-the-spot support was provided.
- A key innovation was the launch of the **Online Contents database.** This will be discussed in more detail in the next section. Results from other projects were also available:
- The **KUBGuide** was a first step in developing a navigational aid in the information environment. In this first version, it was a menu-driven, bilingual terminal interface giving short help in selecting relevant services, such as the OPAC, our local Online contents database, Excerpta Informatica, and various other dedicated databases. The guide also provided access to local information delivered and maintained by faculties and department, and was the predecessor of the current KUBweb home pages.

Tilburg University library was also the first European library with a completely automated self-service circulation system, the Lendomaat. With a subsidy from the Dutch Department of Economic Affairs, this service was designed and realized by combining existing technology (local circulation system, bar code reader, security strips, scanners, printers) and with the cooperation of Tilburg university, Pica, the security firm Checkpoint, and SPC, a software house, responsible for the development of the communication software for the various components.

3. FROM SECONDARY TO PRIMARY INFORMATION

Until 1994, the library focussed on the electronic provision of secondary (bibliographic) information. In 1991, Tilburg University started its own local **Online Contents database** with references to the articles of the 1,600 most important journals the library subscribed to. Content pages were scanned and OCR-ed and the information was locally stored in a database. This local project formed the basis of a national service, which has been running for four years and which is hosted by Pica. In 1995, we closed our scanning department. We now rely on the subset of the national Online Contents database (containing the 12,000 most important and most requested journals in the interlibrary loan circuit in the Netherlands) maintained by Pica. From this database we can download the data that match our own holdings. The data of this Online Contents database

are currently being produced by Swets & Zeitlinger. At Tilburg University, part of this data is supplemented by abstracts delivered by Elsevier Science and other publishers, and abstracts and keywords produced in-house by library staff members.

The provision of the full text of the journal articles to the end-users was a logical next step. In 1994, Tilburg University was the first institution in Europe to enter into a licence agreement with Elsevier Science with respect to their electronic subscriptions. In 1995, electronic access could be provided to the Tiff images of the 120 Elsevier journals on economics and social sciences the university subscribed to. In order to work efficiently with bibliographic data and full text images, Tilburg University developed the KWIK software in cooperation with Digital Equipment. This "KWIK" software is based on the Mercury software, originally developed for Unix workstations at Carnegie Mellon University. At our university, it runs on PCs equipped with MS-Windows software.

It is clear that browsers such as Netscape and the boom of the Internet motivated us to change from a customized and sophisticated approach to open WWW solutions, although this meant losing some functionality, such as a clear distinction between viewing and printing, and performance. Access to bibliographic and full text information is now being provided via WWW, based on the implementation of the results of the project Decomate (Delivery of Copyright Material to End-Users) which was funded by the European Commission. This project was coordinated by Tilburg University, with the London School of Economics and the Universitat Autonomà de Barcelona as partners, and was completed in March 1997. The project received high praise from independent experts appointed by the EC.

The Decomate software is applicable to various local environments and can handle materials from various publishers in various formats. The Z39.50 protocol is used for the transactions with database servers. This software has been updated and improved in Spring and Summer 1997 and is now used as THE way to access the most important databases of the Tilburg University Library. Access is being provided to more than 12 different databases, including the Online Contents Database, the Excerpta Infomatica database and two Silverplatter cd-roms, through one single user interface, using the Z39.50 protocol.

The full text database of Tilburg University was extended with the PDF files provided by Kluwer Academic, Academic Press, and the legal division of Kluwer. The corpus of about 200 full text journals was extended in September 1997 by a new license agreement with Elsevier Science that provides access to 160 journals the library does not subscribe to but which are relevant to the subjects taught at the university. Access to this copyright material will be provided on a pay-per-view basis. For Elsevier and the university it will be interesting to see what happens if these services are offered at affordable costs and with prices compatible with the Inter-Library Loan fees.

In this paper, I will not go into detail about experiences with publishers and our policy with respect to license agreements since these topics will be covered later in the course in more depth.

4. TILBURG UNIVERSITY AND ELECTRONIC PUBLISHING BY RESEARCHERS

It would be unwise for a university library to only focus on digital material delivered by a publisher. Actually, many libraries are discussing a potential new role for libraries in the electronic publication of documents produced by the parent institution.
The library and the computer centre at Tilburg University currently support the **electronic storage and access of research papers** produced by university researchers, in particular, the Department of Economics and CentER, the top institute for economic research in the Netherlands. Faculty members provide the library with a hard copy of their paper as well as an electronic version in Postscript. The library then enters it in the National Catalogue and the local reference database. Conversion of Postscript files to PDF is carried out by the computer centre. Library staff provide the papers with keywords and make these papers accessible through the World Wide Web and the local reference database Attent: Research Memoranda.

This initiative has been expanded to a nation-wide project (The Degree project). All universities with Economics departments are participating to make most of the economic research papers produced in the Netherlands available through the network. In Tilburg, the papers are accessible through a local reference database Attent, through the national WEBdoc database (a project of Pica, Dutch and German libraries and the Research Libraries Group in the US), and through WoPEc, the international database of research papers on economics. The National Funding Council regards this initiative as an example for other subject areas.

Another project deals with the creation of a brand-new electronic journal: The **Electronic Review of Comparative Law**. The goal of this project is to develop an editorial, technical, and organisational concept for an electronic journal which publishes high quality articles in English with an international editorial board. Quality is ensured by high editorial standards and a strict electronic peer review system. We would like to see the electronic format used to its fullest effect: to link articles with legal sources like legislation and judicial texts; to link discussion and comments to published articles, creating an open - but controlled - platform for discussion among peers. The university library will manage the project in close cooperation with the Faculty of Law (which appointed the editor-in-chief), the Law Faculties of Utrecht University and the University of Maastricht, and our Computer Centre.

5. OTHER PROJECTS

Tilburg University library and the computer centre are currently involved in the following projects:

- the development of a serials management information system (local project);

- IT projects at Tilburg University aimed at improving the quality of learning:
  - a project to train the university teachers in order to make better use of the infrastructure and current information technology;
  - course information on the Web;

- a research project on the use of printed and electronic journals in cooperation with the University of Maastricht (nationally funded project);

- ELISE II (European project), the second phase of the successful ELISE project from the Third Framework of the Telematics Programme of the EC. ELISE I produced image banks in two libraries (Tilburg University and De Montfort University, UK) and has demonstrated interconnection. ELISE II aims at the development of an operational infrastructure for networked image information in Europe. The project is coordinated by De Montfort University in the UK, with IBM Scientific, The Victoria and Albert Museum, Limerick University, the Université Libre de Bruxelles, and Tilburg University as partners;

- A very interesting and innovative project, "Virtual Library on Economics" started in July, 1997. It is a cooperative effort between Tilburg and two other Dutch university libraries, the University of Maastricht and Erasmus University, Rotterdam. The project aims at developing a virtual serials collection on economics, since the three libraries together have such a comprehensive assortment of resources on this subject. The first phase of the project is to improve the services to end-users with respect to access to, retrieval and delivery of all journals the libraries subscribe to. The partners regard the extension of services as a practical starting point for cooperation on collection management and collection development. It is envisaged that a user from the University of Maastricht will have seamless access from his or her desktop computer to bibliographic information and abstracts of journal articles stored in electronic or printed form in Tilburg or Rotterdam. It should be guaranteed that the user can have the full document (either in electronic form or a copy of the printed version) within a reasonable time span. Once these facilities are in place, they will offer a tool and act as a basis for decisions about journal subscriptions at all three sites. We regard this as a bottom-up approach to a nation-wide policy of cooperation in collection development. It is obvious that heavily used journals will be needed locally for the time being at three different sites, but long-term agreements can be made on hundreds of specialized journals and journals of the second and third categories.
  This project is funded by the National Science Council as an important initiative to enhance the development of the Dutch Virtual Library.

- In February 1998, a new European project was started: Decomate II. The aim of this project is to develop the European Digital Library for Economics. Access will be provided to important economic databases which are located at various sites through one single user interface. The project deals with distributed and heterogeneous information (catalogues, full text journals, Internet Resources, research papers). Facilities will be developed for efficient simultaneous searching, current awareness service, accounting and the monitoring of the use. The project will be coordinated by Tilburg University. Partners will be the London School of Economics, the Universitat Autonomà de Barcelona, the European University Insititute in Fiesole (Italy), SilverPlatter, and Swets and Zeitlinger.

6. EXPERIENCES WITH THE DIGITAL LIBRARY SERVICES

We have now had five years of experience with the campus-wide use of the services provided on the integrated desktop. On the whole, they have been positive:

1. The library is overcrowded. Students make extensive use of the library resources. Ninety percent of our students regularly use the integrated desktop computers. The library is a meeting point and working place for university students.

2. Most electronic services which have been implemented since 1992 are heavily used by both students and staff.

3. Currently, the "integrated desktop" is not only a cornerstone of the Digital Library programme, it is also widely accepted as a key element in the strategy of the university. It is the basis for IT innovation projects in teaching, learning, and administration.

4. The university library is drawing more and more national and international visitors. Over the last 5 years, the library was visited by more than 7000 professionals, librarians, computer centre managers, and researchers from more than 24 countries.

We have also identified some important problems:

1. The most important problem is that it takes more time to integrate new information services into the educational process of the university than we expected. Individual use by students is excellent, but more faculty could make full use of the opportunities provided by the electronic information environment. A significant number of teachers have so far been reluctant to invest time in new technologies and in an innovative approach to the educational process. It should also be stressed that a growing number of professors and teachers are engaged in projects in order to present their course material in electronic form and to stimulate interactive use of the current electronic facilities.

2. New services demand instruction, training, and user support. The library should not underestimate this. The fast changes in programmes and interfaces are easily accepted by some users but can be an awful surprise for many others. The need for a coherent and well elaborated planning and communication policy is obvious. First of all, however, there is a need for a constant interaction with users about what will happen tomorrow and why, and which issues can be decided locally. A balance should be found between the need to offer state-of-the-art services and the need to maintain a homogeneous and well accepted infrastructure.

3. The open environment in the library requires more regulations with respect to the use of the computers by students (for that reason, a reservation system and a time-out system have been developed), security measures, and clear policies for proper and correct use of the facilities.

7. USER DEMANDS

It will take some time for new facilities to completely mature and be adopted by all users. It is also clear that the development towards the provision of full text articles to the desk-top will soon result in a completely normal service. Top researchers who are currently regular users of our database are very enthusiastic about it and want us to proceed. This indi-cates that in a couple of years the digital library, or rather the networked library, with ample access to digitized or digital material, will be an accepted phenomenon and a standard service.

The initial phase in the development of the digital library too frequently confronted the users with changes. Stability in systems and services is required for users to feel comfortable. It would be a good thing if we could manage to maintain the "look and feel" for the end-users and to make improvements and new versions "behind the screens".

Another demand from the user community is that we should provide one interface to heterogeneous databases and make everything much simpler: one way to access our OPAC, our reference databases, our cd-roms, with full potential for simultaneous searching across these databases and with a guarantee for document retrieval and fast document delivery.

The most important issue that is mentioned by users is that they expect the library to support users and provide tools and tailor-made facilities to deal with the information overload. This offers important opportunities for libraries to redefine traditional roles and functions: selection, service, and support. The skills and know-how of library staff can play a significant role in meeting these challenges.

The important role of library staff was confirmed in a user study carried out in 1996 on the services provided by the computer centre and the Tilburg University library. One of the interesting results of this study was that students very much appreciate the computing facilities and electronic services, but regard the staff of the library as the most important category. The support, skills, and attitude of staff is the most important factor in determining the performance and appreciation of the library from the students' point of view.

8. LIBRARY STRATEGY

8.1 Access and ownership

Libraries will identify their own strengths and weaknesses and decide on their strategy for the future according to their own specific situation. However, one of the important aspects for most libraries deals with the strategy of access and ownership of documents. There is an increasing focus on **management information** and selection of relevant information, irrespective of where and how the information is stored. This is particularly true for libraries that have limited resources. These libraries have to make firm decisions and choices based on the strengths and scope of their parent institution. The opportunities for cooperation, partnership, and creation of consortia will be carefully considered.

8.2 Knowledge navigation

In addition to a seamless access to heterogeneous databases which are distributed and located at various sites, we would like to implement **personalized information services** for the end-users: current awareness services based on defined **user profiles**.

It is clear that for many researchers the key issue is how to deal with the information overload. Most of them do not want to read more, they want to read less. The information selection process is a critical issue. For that reason, it is important to provide and refine tools for tailor-made selection of information. Supporting the discovery of knowledge might become the most important activity with which the library can support the information process making use of traditional library skills which are completely upgraded and adapted to the electronic environment.

These initiatives indicate that we are gradually shifting from activities related to the development of the local digital library to activities that focus on interconnection with other rich information sources, gradually creating user access to the "virtual library". Additional tools to navigate in this virtual environment are imperative.

8.3 Integration with teaching and research

The third cornerstone of the strategic goals of the Tilburg University library for the next three or four years emphasizes local dissemination and stimulation of a structural **integration of the digital/virtual library services with teaching, learning, and research.**

The availability of full text information and capabilities to do full text searching, and to cut and paste relevant pieces of information will increase the use of the integrated desktop. Scientific work will be more effectually supported. There are also important opportunities for redesigning the educational process. It will be clear that the key to change can only come from the faculties. Libraries can only support this change in interaction with the users.

From our perspective we can and will focus on:

1. clear information on services and systems;
2. more continuity and stability in the "look and feel" of the end-user environment;
3. tailor-made training facilities for university staff;
4. instruction for students as an integral part of the curriculum;
5. personal and electronic support;
6. tailor-made current awareness service;
7. collaborative research projects with university staff.

For the future of a university library, it will be vital to enter into new partnerships with the staff of each faculty and to support their work in a new fashion. Although the information is available in a virtual environment and users do not necessarily have to go to the library, the library will still be a real organisation dependent on the skills and knowledge of its staff.

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